

Claims

[c1] What is claimed is:

1. A fine-tunable RGB mixing light emitting diode (LED) comprising:

a red LED unit electrically connected to a first embedded variable resistor;

a green LED unit electrically connected to a second embedded variable resistor; and

a blue LED unit electrically connected to a third embedded variable resistor;

wherein spectrum of the RGB mixing LED can be fine-tuned by adjusting resistance of the first, second, and third embedded variable resistors by laser-trimming.

[c2] 2. The RGB mixing LED of claim 1, wherein the first, second, and third embedded variable resistors comprise printed resistors or thin-film resistors.

[c3] 3. The RGB mixing LED of claim 1, wherein resistance of the first, second, and third embedded variable resistors is adjusted by laser trimming the first, second, and/or third embedded variable resistors.

[c4] 4. A RGB mixing light emitting diode (LED) comprising:

a red LED unit electrically connected to a first embedded variable passive component;
a green LED unit electrically connected to a second embedded variable passive component; and
a blue LED unit electrically connected to a third embedded variable passive component;
wherein spectrum of the RGB mixing LED can be fine-tuned by adjusting resistance of the first, second, and third embedded variable passive components.

- [c5] 5. The RGB mixing LED of claim 4, wherein the first, second, and third embedded variable passive components comprise an embedded variable resistor, an embedded variable capacitor, or an embedded variable inductor.
- [c6] 6. The RGB mixing LED of claim 5, wherein the embedded variable resistor comprises a printed resistor or thin-film resistor.
- [c7] 7. The RGB mixing LED of claim 4, wherein spectrum of the RGB mixing LED is fine-tuned with laser-trimming the first, second, and/or third embedded variable passive components.
- [c8] 8. A light emitting diode (LED), comprising:
a LED unit; and
an embedded variable electric device electrically con-

nected to the LED unit;

wherein, brightness of the LED can be fine-tuned by adjusting the embedded variable electric device.

[c9] 9. The LED of claim 8, wherein a plurality of LED units and a plurality of corresponding embedded variable electric devices can be further connected to constitute the LED in parallel or in series.

[c10] 10. The LED of claim 9, wherein the LED units radiate light of different colors.

[c11] 11. The LED of claim 8, wherein the embedded variable electric device is an embedded variable passive component.

[c12] 12. The LED of claim 11, wherein the embedded variable passive component comprises an embedded variable resistor, an embedded variable capacitor, or an embedded variable inductor.

[c13] 13. The LED of claim 12, wherein the embedded variable resistor comprises a printed resistor or a thin-film resistor.

[c14] 14. The LED of claim 8, wherein the embedded variable electric device is an embedded variable active component.

[c15] 15. The LED of claim 14, wherein the embedded variable active component comprises a diode or a metal oxide semiconductor (MOS), and the embedded variable active component connects with the LED unit in series or parallel.

[c16] 16. The LED of claim 8, wherein brightness of the LED can be fine-tuned with laser-trimming the embedded variable electric device.